chief reefs here are on the Kalu-Kalukuang bank, 98 by 58 km.; on the several Laars banks, about 65 km. in total length; on the Postillion bank, 140 by 50 km.; and on the Paternoster bank, 115 by 26 km. The 40-fathom depth of the bank margins is ascribed by Molengraaff, following Daly's Glacial-control theory of coral reefs, to abrasion during the Glacial epochs of lowered sea-level, particularly to the phases of rising sea-level; but it may be more plausibly ascribed to wave-and-current aggradation with reference to normal sea-level in post-Glacial time, as above suggested. For even if a bank 50 or more km. in diameter were cut away by the waves during the lowered stand of the ocean in the Glacial period, its margin ought to have been at least 20 or 30 fathoms below the sea-level of that time and hence not 40 but 55 or 65 fathoms below present sea-level, with a gradual shoaling toward its center. Departures from such a form should therefore, under the explanation of the banks by abrasion, be accounted for by post-Glacial reef growth and submarine aggradation. In any case, it would appear that, if no disturbance takes place, these imperfectly reef-rimmed banks will in time develop into typical atolls of large size.

W. M. D.

Atollen in den Nederlandsch-Oost-Indischen Archipel. De Riffen in de Groep der Toekang Besi-Eilanden. (*Atolls in the Dutch East Indies.*) Door DR. B. G. ESCHER. Batavia, Java: Mededeelingen . . . . Encycl. Bureau, Vol. XXII, 1920, pp. 7–18.

There has been discussion for some years past among the geologists of the Dutch East Indies as to the occurrence or absence of true atolls in their archipelago. Although atolls are certainly rare in that region, the occurrence of several typical examples is made clear by Escher, who had opportunity in March, 1919, of examining several reefs in the Tukang Besi group, southeast of Celebes. A copy of the original survey of the islands by the Hydrographic Service of the Dutch East Indies on a scale of 1:200,000, containing a greater number of soundings than those represented in the chart published for the use of navigators, is reproduced in Escher's paper. It shows seven atolls, the smallest about 2 km. in diameter; the largest measuring 48 by 15 km. and inclosing a lagoon 15 or 20 fathoms deep. Escher points out that these atolls lie in two belts, trending northwest-southeast, 100 or 130 km. in length, and that between the two belts and to the northeast of both of them are two roughly parallel belts of high islands bearing raised reefs, with fringing reefs at sea-level. The overall breadth of the four belts is about 140

km. These facts lead him to conclude that the two atoll belts have subsided, while the two high-island belts have risen; in a word, that the region has suffered a gentle folding, the atolls growing upward in the faint synclines. True-scale profiles show the exterior slopes of the atolls to vary from 30° to 69° down to depths of from 100 to 400 fathoms. It may be added that the prevailing absence of atolls in the deep seas inclosed by the islands of the East Indian archipelago is plausibly explained by the too rapid subsidence of the sea bottoms and of any islands that may have risen from their deeper parts in that very unstable part of the earth's crust.

W. M. D.

Les Iles Wallis et Horn. (*The Wallis and Horne Islands, Pacific Ocean.*) Par le DR. M. VIALA. Bull. Soc. Neuchât. de Géogr., Vol. XXVIII (1919), pp. 209–83. With halftone plates and an outline map of Wallis, 1:60,000.

The author of the above-cited article served as resident physician on the islands, which are French possessions, from 1905 to 1909; his geographical descriptions are general; his notes on the natives are much more detailed. Wallis, northeast of Fiji, consists chiefly of a main island, Uvea, of volcanic origin, 18 km. long by 6 or 8 km. wide, and about 200 m. in altitude; but there are also nineteen small satellite islands close by, of which three are volcanic, and the others are of coral origin. About half of the latter stand on the fine barrier reef, which, about 100 m. broad and interrupted by only four narrow passes, encircles the main island. The inclosed lagoon is from 2 to 5 km. wide, and is much interrupted by shoals: its depth is not stated. A well-formed fringing reef surrounds Uvea, so that canoes can reach the shore only at high tide. A wharf for larger vessels is built across the fringing reef at the chief village. While the low coral-sand islands are covered with luxuriant vegetation, the uplands of the main island have an infertile clayey soil and bear but scanty vegetation, chiefly ferns; except that a few cavities, interpreted as ancient craters and about 50 m. deep, have a richer growth; one such cavity contains a small lake. The uplands descend to an irregular shore line, where sand flats, often inclosing shallow lagoons of small size, afford the only cultivable ground; here the villages lie and here the coco-nut palm flourishes, yielding the most important commercial product of the islands; but rats abound and injure the crop. There are no streams, but springs emerge at the inner border of the sand flats. The southeast trade wind, blowing continuously and often